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Opinion

Implementation of Basic Science Curriculum in Nigeria private secondary schools: Problems and prospects

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ABSTRACT: Nigeria accepted education as an instrument for national development and as a tool to enhance the formulation of ideas, rapid growth, as well as a devisor of all worthwhile interactions and ideas that are capable of fostering both individual and societal development. This paper digs into the issues surrounding effective implementation of Basic Science Curriculum in Nigeria private secondary schools: problems and prospects. The position of Basic Science as the bedrock for all science subjects in the secondary school has led to its inclusion in the school curriculum. The paper advocates the implementation of Basic Science Curriculum to ensure the optimal attainment for sustainable development in Nigeria. The paper also examined the importance of Basic Science Curriculum and the challenges facing its teaching, among others. Finally, the paper recommended massive advocacy and sensitization of teachers, students, parents and school administrators and supervisors who are the end-users of the new curriculum for its effective implementation. Recommendations which if properly effected would enhance effective teaching of basic science have also been discussed.

Keywords: Basic Science Curriculum, implementation, private secondary schools, problems and prospect.

INTRODUCTION

The position of Basic Science as the bedrock for all science subjects in the secondary school has led to its inclusion in the school curriculum. This paper has discussed the evolution of Basic Science as a replacement to Integrated Science as well as its objectives. The paper also examined the importance of Basic Science and the challenges facing its teaching such as lack of motivation of teachers, lack of interest among students, and lack of infrastructural facilities among others. To this end, there is every need to review the status quo of curriculum in Nigeria in order to consolidate further the new basic education program that will ensure effective actualization. Finally, the paper recommends massive advocacy and sensitization of teachers, students, parents and school administrators and supervisors on the new curriculum to aid effective implementation. Recommendations which if properly effected would enhance effective teaching of basic science have also been discussed. Curriculum is a dynamic programme that is expected to address the changing needs and aspirations of any society (Igbowbuke, 2007). Nigerian policy-makers and educators recognize the role of science and technology in the achievement of education for all and national development in the present millennium. This has informed an evaluation process that led to the development of the nine-year basic science and technology curriculum of the universal basic education. The curriculum was implemented in September 2008 in primary one in Nigeria.It is appropriate to say curriculum is all about experience required of a child for all round development since the organization of schooling and further education had long been associated with the idea of curriculum. Curriculum is a particular form of specification about the practice of teaching. It is not a package of materials or syllabus on ground to be covered

rather it is a way of translating educational idea into a hypothetical statements. It invites critical testing rather than acceptance (Stenhouse, 2013). Furthermore, curriculum is said to be a specification about the practice of teaching which involves pragmatic efficacy of the learners' experiences. Experience as a general concept comprises knowledge of or skill of something or some events gained through involvement in or exposure to that thing or event. In this wise, curriculum is an important element of education in which overall objectives of education depend largely on the nature of the curriculum (NERDC, 2000).

Curriculum experts have argued that curriculum making either at the level of development, design, implementation or reformation needs the inputs of critical stakeholders if it is to be relevant, meaningful and adequate to meet the needs of the people for whom it has been put together. In his opinion, Bobbit (2000) contends that education is a social construct which is a part of society and should reflect the community. In this sense, curriculum is the thrust of education vested with force thereby integrating societal trends, traditional values and individual expression. In his conception of curriculum, the author affirmed that curriculum is the course of deeds and experiences through which learners become the adults they should be for success in adult society. In other words, curriculum encourages the entire scope of formative deed and experience occurring both within and outside school for the purposeful formation of adult members of society.

However, curriculum may refer to a well-defined and prescribed course of studies, which students must fulfil in order to fulfil a certain level of education. That is, curriculum is being construed as learning activities that make up a particular system of education. Ackerman (2015) in his examination of cognitive development theory explained in details how the curriculum is sequenced in schools of which basic science is one of them. Basic science formerly known as Integrated Science is the first form of science a child comes across at the secondary school level. Basic science is a core subject in the National Curriculum at the upper basic level.

All students from upper Basic I to III classes must offer and study the subject. Basic Science is considered the bedrock of all science subjects at the senior secondary school (SSS) level. The subject prepares students at the upper basic level for the study of core science subjects (biology, chemistry and physics) at the senior secondary school level (Chukwuneke and Chikwenze, 2012). That is why further emphasised that for a student to be able to study single science subjects at the senior secondary level successfully, such a student has to be well grounded in Basic Science at the upper basic level. Based on this, it is generally taught as a single science subject, until in the SSS level, and then split into specialized science subjects (biology, chemistry and physics). It is expected that those students who achieve well in basic science should be given the opportunity to study the separate science subjects at the SSS level.

Basic Science is a revolutionary new introductory science curriculum developed at Princeton intended for students considering a career in science. Basic Science emphasises scientific literacy and research oriented learning. The subject encourages exploration of student's immediate environment. As a result, Basic Science teachers continue to learn along with their students. The teaching of Basic Science is therefore, based on the philosophy of active learner-participation in the process whereby, students are encouraged to learn by constructing their own knowledge based on what they already understand as they make connections between new information and old information, guided or facilitated by the teacher. Under this philosophy, students are encouraged and led to discover concepts and generalizations based on their experiments. Akinmade (2007) in his research rightly pointed out that, when children learn science using the process and activity approaches, they improve their ability to apply intellectual skills to solve problems, improve their language development, become more creative, master science content better. The plight of secondary school curriculum implementation in Nigeria has been attributed to many factors including funding, obsolete educational facilities, and inadequate qualified teachers among others, it is against this backdrop, this paper examines the challenges confronting effective implementation of new secondary school curriculum in Nigeria with a view to proffering far reaching solutions.

CONCEPS OF CURRICULUM

The word curriculum was coined from the Latin word "currere" meaning "race course", referring to the course of deeds and experiences through which children grow to become mature adults. Curriculum is the set of courses and their contents offered at a school or university. A curriculum is prescriptive and is based on a more general syllabus, which merely specify what topics must be understood, and to what level to achieve a particular grade or standard. That is, a curriculum may be referred to as all courses offered at a school.

According to Kelly (2011), "curriculum is all the learning which is planned and guided by the school, whether it is carried out in groups or individually, inside or outside the school". In other words, curriculum specifies in advance what we are seeking to achieve and how we are to go about it. He also sees curriculum as a planned leaning experience offered to a learner in school, adding that it is a program of studies made up of three components program of studies, program of activities and programme of guidance. Hence, the meaning of the term curriculum has also been changed to meet the needs of education of different courses of studies. Blenkin (2000) defines curriculum as a body of knowledge contents and or subjects. That is, curriculum is the process by which know-

ledge and skills are transmitted or delivered to learners by the most effective methods that can be devised.

Curriculum is an organized plan of course outlined with the objectives and learning experience to be used for achievement of these objectives. In a wider perspective, it is a way of preparing individuals to become productive citizens and useful member of the society to which they belong. Thus, curriculum is a tool of education to educate and humanize the whole man. Modern interpretation sees the curriculum as all the knowledge and experience got by a child in and out of the school walls, either on the time table or outside it i.e. the experiences the learner has regardless of when or how they take place.

Jeffs and Smith (2013) argued that the notion of curriculum provides a central dividing line between formal and informal education. Recognizing the fact that some informal educators adopted curriculum theory and practice as a desire to be clear about content, and the approaches to the curriculum which focus on objectives and detailed programmes appear to be compatible with all round development of the learner.

Prescriptive view of a curriculum is defined as a plan for action or written document that includes strategies for achieving desired goals or ends. In other words, curriculum means a written description of what happens in the course of study. Considering curriculum as the course of experiences that form human beings into persons. The author affirmed curriculum as those things which students learn because of the way in which the work of the school is planned and organized but which are not in themselves overtly included in the planning or even in the consciousness of those responsible for the school arrangements. This assertion recognizes the current appreciation of curriculum theory and practice emerged in the school and in relation to other schooling ideas such as subject and lesson. In this wise, curriculum could be seen in four ways as follows:

1. Curriculum as a body of knowledge to be transmitted;
2. Curriculum as an attempt to achieve certain ends in students;
3. Curriculum as process;
4. Curriculum as praxis.

To achieve any of the above-mentioned, effective implementation of a well-planned curriculum cannot be over-stretched. The word curriculum was derived from the Latin word “Curere”, which meansto run a race. It is a race course, which implies that the moment a child starts school; the race begins and stops at the end of the child’s educational career. Curriculum in a formal setting can be seen as the planned learning experiences offered to the learner in the school. curriculum is a programme which is made up of three components: programme of studies; programme of activities and programme of guidance. Curriculum implementation is a network of varying activities involved in translating curriculum designs into classroom activities and changing people’s attitudes” to accept and participate in these activities”. The belief is that the final step into curriculum planning consists of implementing the curriculum in the classroom and continued monitoring, reflection, and evaluation to improve it

OVERVIEW OF THE BASIC SCIENCE CURRICULUM

The 9-year Basic Science and Technology Curriculum is the product of re-alignment and restructuring of the revised curricula for Primary Science and Junior Secondary School Integrated Science. In selecting the contents, three major issues shaping the development of nations worldwide, and influencing the world of knowledge today were identified. These are globalization, Information and Communication Technology (ICT) and entrepreneurship education.

The curriculum of the basic is unique in several aspects. This therefore calls for the preparedness of Science, Technology and Mathematics (STM) teachers towards effective reform of STM education and basic science teaching in junior secondary schools. Basic Science properly evolved from Integrated Science. Some relevant themes in integrated science are still maintained in the Basic Science Curriculum. Integrated Science is a science presented to child in such a way that the child gains the concept of the fundamental unity of science, the commonality of approach to problems of scientific nature and an understanding of the role and function of science in everyday life and the world in which they live (Federal Republic of Nigeria, 2013). The desire of Nigeria to be identified with contemporary development worldwide, called for the infusion of relevant contents of four non-school curriculum innovations in the areas of; Environmental Education (EE), Drug Abuse Education (DA), Population and Family Life Education (POP/FLE) and Sexually Transmitted Infection (STI) including HIV/AIDS. Infusion of content occurred in every class from basic 1 to 9. Some introductory technology topics have been introduced at the lower and middle levels, while leaving the upper level with purely science topics.

Objectives of the new Basic Science Curriculum

The overall objectives of the new Basic Science Curriculum outlined by Adeniyi (2007) are to enable the learners to: Develop interest in science and technology; acquire basic skills in science and technology; apply their scientific and technological knowledge and skills to meet societal needs; take advantage of the numerous career opportunities offered by science and technology; and become prepared for further studies in science and technology.

In order to achieve a holistic presentation of science and technology contents to learners, the thematic approach to

content organization was adopted. Consequently, four themes were used to cover knowledge, skills and attitudinal requirements. These are: You and Environment, Living and Non-living Thing, You and Technology, You and Energy.

At the upper basic level however, theme “3” You and Technology was changed to “Science and Development”. The topics under each theme were sequenced in spiral from beginning with the simple to the complex across the 9 - year of basic education in order to sustain the interest of learners and promote meaningful learning.

The use of guided inquiry method of teaching and learning is implied in the activities prescribed under each topic in order to promote learning by doing and skills development. The theme “Science and Development” was added to expose students to developments in science and technology alongside skills that will enable them to face challenges, make informed decisions, develop survival strategies, and learn to live effectively within the global community.

Basic Science curriculum and development in Nigeria

The basic science curriculum which is in use in Nigeria for science teaching and learning in the junior secondary school had built-in strategies where the learners are required to be involved in inquiry and related activities that can develop critical thinking skills. Basic Science on the other hand is basic training in scientific skills required for human survival, sustainable development and societal transformation. Basic Science combines science and technology. The general goal of the curricular reform was to reflect depth, appropriateness and inter-relatedness of the curriculum contents. Emerging issues which covered valve orientation, peace and dialogue including human right education, family life, HIV/AIDS education, entrepreneurial skills etc. were infused into the 9-year Basic Education curricula. Additionally, the curricula planners agreed that major issues shaping national and global development such as globalization, information/ communication technology were the rhetoric of Basic Education curricula. Basic Science curriculum contents are arranged in particular order of thematic and spiral pattern. Thematic arrangement means that the contents, principles, facts, concepts are organized in themes that is, broad themes and sub-themes taking into account the learners needs, interest and overall societal problems and demands in the present age of science and globalization. In the area of environmental education, students are meant to study and understand the environment in which they live, in other to words, the development of the society is inter connected with man’s physical environments. According to Akpokiniovo (2015). The intention of UNESCO favourably support school disciplines such as Basic Science, in learning the values. UBEC (2008) pointed out that Government syllabi aim at assessing accommodates ability to recognize role as an I nformed citizen and his contribution towards the achievement of development. The author highlighted the aims of Environmental Education is to develop in the minds of the students' positive attitude towards the achievement of sustainable development national unity and nation building. Taking a close look at Drug Abuse, from its inception, if student have been informed about the danger of drug abuse earlier, the rate at which it brings havoc to nation will decrease. The Basic Science Curriculum inculcates the right values and norms of the society to foster development. In the area of population and family life education, Nigeria has an average population of 160 million with over 34% of this population that are jobless, if the right and value of the society is to be accomplished, then the objectives of Basic Science must be achieved, in terms of planning the family life, students now have the opportunity to learn how to maintain a healthy family by taking necessary precaution that will bring development to the society. Thus, if the individual family is healthy, then development is sure. In the area of sexually transmitted infection (HIV/AIDS), before now the rate of HIV/AIDS is really on the increase, however, with the introduction of condom and sex education in the Basic Science Curriculum, students are now been exposed to the implication of these various infections, due to the introduction of condoms and sex education, these various infection has really decrease, which has in turn fostered development in Nigeria education.

Basic Science equally helps to bring information; action and international education. UNESCO (2000) stressed that education should include critical analysis of the adequate information and contemporary factors of an economic and political nature underlying the contradictions and tensions between countries together with the study of ways of overcoming these contradictions, which are the real impediments to understanding true international co-operation and the development in the area of quality education. Thus, if education and development is to be sustained, then the objectives of the Basic Science Curriculum need to be achieved.

The importance of basic science in everyday life can never be over emphasized. It serves as the bedrock which provides the required training in scientific skills to meet the growing needs of the society. It is the fundamental knowledge acquired through basic science at the upper basic level that leads to the transformation of the world through dramatic advances in almost all fields including medicine, engineering, electronics and aeronautics among others. The application of scientific knowledge acquired through basic science helped many countries like China and India to transform from poor feudal type economies to become economic and industrial power houses and in several ways compete effectively with developed countries. Basic science is of great importance because early experiences in science help students to develop problem-solving skills that empower students to participate in an increasingly scientific and technological world.

Basic Science is the type of science which provides

unique training of students in observation, reasoning and experiment in the different branches of science; it also helps students to develop a logical mind. Basic Science enables students to be systematic and enables them to form an objective judgement. Basic science, if taught according to its philosophy, equips students with the necessary introductory scientific and technological knowledge and skills necessary to build a progressive society. This forms the bedrock on which scientific and technological studies rest. According to Chukwuneke and Chikwene (2012), the basic science curriculum was introduced in response to the reform in education sector, that is, the introduction of 9-year continuous basic education. Unfortunately, there are so many challenges facing the implementation of this curriculum and some of these challenges are as follows: The teacher factor, inadequate funding of the programme, inadequate classroom block, inadequate instructional materials, ill equipped library, ill equipped laboratories and poor method of teaching.

The teacher factors

The six months training given to the UBE teachers at the take-off of this programme can never be adequate in equipping the teachers with the necessary competence, knowledge, and skills needed to meet up with the goals and objectives of this curriculum. Most of the teachers teaching the basic science are single science specialist and are completely ill equipped to handle this new curriculum in any way. In other words, the teachers who are implementers of the curriculum are not trained for the programme. Again, is the issue of inadequate number of teachers. In most schools, teachers teaching this basic science are completely inadequate in number. A situation where only two teachers may be teaching basic science from JS1-3, which may have up to 10 streams per level, does not augur well. In this type of situation, the aim of the programme has been defeated.

Inadequate funding

The success of the entire programme largely depends on funding. With the present inadequate provision of funds, the implementation of the curriculum is just like chasing a mirage. There is no meaningful strategy for generating enough funds to ensure that facilities needed for the workability of the curriculum are supplied in significant quantity.

Inadequate classroom block

No meaningful learning takes place in an overcrowded classroom. That is why Oyesola et al. (2000) noted that the provision of classroom block plays a major role in the achievement of the set education goals. Science is activity oriented. What type of activity is expected to take place in a class of 70 to 80 students? So, the fact remains that curriculum is never implemented at the classroom level but on paper.

Inadequate instructional materials

For successful science teaching, a science teacher requires instructional material to illustrate, emphasize and explain his lesson for easy comprehension and possible application to real life situation. Some of these materials include, chalk, chalk board, models, charts, teacher‘s guild, self-learning modules etc. are grossly inadequate in schools. In many schools the teacher finds it difficult to get chalk to write on the board. UNESCO (2000) stated that instructional materials are very important in the actualization of the curriculum. So, lack or inadequate provision of the instructional materials poses great threat to the implementation of the basic science curriculum.

Inadequate instructional facilities

The provision of library services is very essential at any level of education, now that there is information boom and also to enhance the spirit of inquiry among students. It is therefore of great importance that library services should be provided for the UBE programme to enable the children to have access to learning materials and information that facilitates their learning process. Unfortunately, you find out that in most secondary schools, library exists only in name with outdated books and no modern library facilities exist. Where library exists at all, no one supervises to ensure that the children use the library effectively as to inculcate the habit of reading in the students.

Inadequate laboratories

Both the basic science laboratory and the computer laboratory where they exist at all are completely ill-equipped. Most equipment/materials needed for practical work are not available in schools. In a research carried out by Eya and Elechi (2011), they reported that most equipment necessary for meaningful practical work on basic science are not available and where they are available, most basic science teachers do not know how to use them. In other words, they are under-utilized. This challenge also hinders the achievements of basic science goals and objectives.

Poor method of instruction

Process-oriented activities are not usually carried out in science class rooms in Nigeria. Pupils are seldom

confronted with first-hand concrete experience which could allow them perceive relationship, predict events and draw conclusion. The Basic Science Curriculum specifies hands on process and skill acquisition.

Most Basic Science teachers use the conventional method of teaching which have been found to be deficient in enhancing learning and achieving the objectives of Basic Science Curriculum. Basic Science is the basic training in scientific skills required for human survival, sustainable development and societal transformation. Inquiry method is hardly used in teaching. Teachers rely mainly on lecture method of teaching due to lack of adequate equipment and materials for practical work and also as a result of the fact that most teachers do not know how to use the available equipment/materials for practical work. This is a very big challenge facing the implementation of Basic Science Curriculum where students are required to enquire, invent, predict and control events.

WAY FORWARD

For the effective delivery of the UBE Basic Science Curriculum to attain its noble objectives, the following are the way forward:

1. Due to the fact that no education system can rise above the quality of its teachers, Basic Science teachers should be given opportunity for in-service training to improve their professional expertise. The Basic science teachers are regarded as the most vital resource in the education industry and at such should be sponsored to seminars, workshops and conferences to be abreast with modern technology in other for them to be innovative to bring development to the nation.
2. The Basic Science laboratories should be adequately equipped to enhance learner centred activities which involve the acquisition of scientific, technological and entrepreneurial skills in order for student to capture the major elements during teaching.
3. Adequate library facilities should be provided in schools so as to help cultivate the habit of reading among students. There should be regular supervision of these students to ensure that the students use the library effectively well to facilitate their learning process and curb some social vices like examination malpractice, cultism as they hinder the development to the nation.
4. Cultural and family-restraining, inhibiting conditions must be systemically broken down in school by exposing and encouraging both sexes to participate actively in all school activities.
5. If the Nigerian educational system is to develop and compete favourably with advanced countries of the world, there is the need to monitor and evaluate each stage of the implementation process of UBE to ensure adequate utilization of funds in the provision of resources (human, material and infrastructure) as well as compliance with National Policy on Education as reflected in the UBE Act of 2004.

Conclusion and suggestions

The UBE Basic Science Curriculum in conception and disposition has the capability of developing the nation even beyond the vision 2020 if properly implemented. It will enable Nigerian teachers and learners and the entire society to adjust and adapt to such complex social, scientific and technological changes that would create a new Nigeria, capable of holding out in the emerging new world order. However, the political class has often paid leap service to education issues thereby putting the system in an unpleasant state. There is therefore the need for change of attitude on the part of the political leaders. The planning and funding of education requires the contribution of all if Nigeria must progress at this state of development beyond 2020. The need to catch up with the western world's level of development always remind the leaders that education has been expected to bring national development, but that certain problems have not allowed the expectation to be achieved.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

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